

FREQUENCY-INDEPENDENT SPATIAL PROCESSING FOR WIDEBAND MISO AND MIMO SYSTEMS

ABSTRACT

Frequency-independent eigensteering in MISO and MIMO systems are described. For principal mode and multi-mode eigensteering, a correlation matrix is computed for a MIMO channel based on channel response matrices and decomposed to obtain N_S frequency-independent steering vectors for N_S spatial channels of the MIMO channel. N_D data symbol streams are transmitted on N_D best spatial channels using N_D steering vectors, where $N_D = 1$ for principal mode eigensteering and $N_D > 1$ for multi-mode eigensteering. For main path eigensteering, a data symbol stream is transmitted on the best spatial channel for the main propagation path (e.g., with the highest energy) of the MIMO channel. For receiver eigensteering, a data symbol stream is steered toward a receive antenna based on a steering vector obtained for that receive antenna. For all eigensteering schemes, a matched filter is derived for each receive antenna based on the steering vector(s) and channel response vectors for the receive antenna.